

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Laurent Bazinet et al.

Application No.: 10/591,238

Art Unit: 1724

Filing or 371 (c) Date: 05-14-2007

Examiner: RAPHAEL, COLLEEN M

Confirmation No.: 9269

For: Process And System For Separation Of Organic Charged Compounds

DECLARATION BY Professor Gérald POURCELLY

I, Gérald POURCELLY, under 37 C.F.R. 1.132 hereby declare as follows.

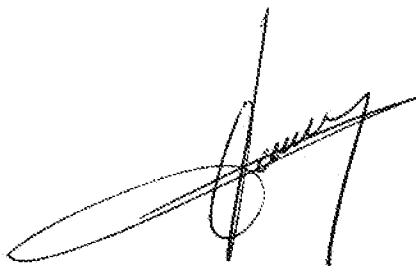
1. I, received my Ph.D from INSA-University of Lyon in 1976 and I am presently Professor of Physical Chemistry at the University of Montpellier 2 and researcher in the research group: "Ionic Transport ; Electroseparations" at the European Membrane Institute at Montpellier (IEMM).
2. I have worked with membrane separation for more than 30 years. I have published more than 135 articles on membrane and membrane separation, and my expertise fields focused on Electromembrane processes applied to agro&food industry, water treatment, environment concerns and energy. I was Director of the "European Membrane Institute" (IEMM) from 2003 to 2010. I am presently on the editorial boards of of "*The Journal of Membrane Science*", "*Desalination*" and "*Water Treatment*" and Director of the Russian-French International Associated laboratory "Ion Exchange Membranes and associated Processes (MEIPA).
3. A true and accurate copy of my curriculum vitae is attached herewith as Exhibit A.
4. I have reviewed and understand the patent application referred to above.
5. I have also reviewed and understand the Office Action dated October 26, 2011 and the reference from Laustsen cited therein.
6. I have been particularly asked to describe why it is my opinion U.S. Patent No. 5,437,774 ("Laustsen") cannot be viewed as describing a filtration system that works without application of pressure when the system has a combination of ED and a filtration membrane, such as a UF membrane, and further, why a scientist in the area of membrane sciences would not have expected a system as described in Laustsen, or any other system that had a combination of ED and filtering membranes, to work if no pressure would be applied.
7. It is well known that filtration membranes, such as UF membranes have poor conductivity.

8. Laustsen appears to describe combined use of a filtration membrane and ED.
9. Laustsen specifically used pressure difference to drive the molecules through the filtration membrane whenever his system had a filtration membrane.
10. For example, Laustsen stated that:

“by **controlling** electrical potential **and differential pressure** across the separation and the retention membrane, one of the molecular species can be selectively passed through the separation membrane into the dialysate while the other of the molecular species is contained between the separation and retention membranes in the aqueous media. (Col. 2, lines 50-56).
11. Although Laustsen describes that in certain circumstances the use of pressure can be optional (col.2, line 60 and col. 5, lines 57-58), a scientist in the membrane sciences, even to this day, would view this statement as lacking credibility if it were to be considered to relate to systems with both ED and UF filters, especially in view of the conditions used in the Example of columns 11 and 12 of Laustsen.
12. Laustsen teaches a pressure range between 0.1 to 15 psi (col. 8., lines 57-62). In the examples, Laustsen applied pressure 1.6 psi and 0.6 psi with a **differential pressure of 1 psi**. Laustsen used a voltage of 160V (column 12, line 27) in a cell of 0.5mm spacing between membranes (column 11, line 38) that resulted in an electric field of **533 V/cm**. Despite the help of pressure differential in addition to the very high electric field, Laustsen had to use a heat exchanger to maintain temperature below 30 C to avoid denaturation of the proteins. This demonstrates that unlike in the current inventors’ method, the process of Laustsen produces significant amount of heat as a result from the current that produces resistance, even with the help of a differential pressure of 1 psi. Production of heat is a significant problem if one wishes to isolate non-denatured proteins. Thus, nothing in Laustsen describes how to get a protein through a UF membrane without pressure.
13. It is my opinion that there is simply no way that upon reading the extreme conditions of this example, a person skilled in the art would believe that this process could work under no pressure differential and low voltage suitable for selectively separating molecules with close molecular weights.
14. It is also my opinion that Laustsen does not describe any conditions that would allow pushing molecules through a UF membrane without pressure differential.
15. In view of the knowledge in the field regarding poor electrical conductivity of filtration membranes, even if one would have considered using no pressure in an ED/UF system, one would not have expected useful amounts of molecules to pass through the UF membrane if no

pressure was applied to assist driving the molecules through it. Moreover, one would have expected a high likelihood of denaturation of any proteins one would have tried to isolate with such a method either due to pH or temperature changes as described above.

16. I hereby declare that all statements made of our own knowledge are true and that all statements made on information and belief are believed to be true, and that willful false statements and the like are punishable by fine or imprisonment, or both under 18 U.S.C. §1001, and may jeopardize the validity of the application or any patent issuing thereon.

A handwritten signature in black ink, appearing to be 'Gérald POURCELLY', written over a horizontal line.

Signature: Gérald POURCELLY

Date: February 22, 2012